STUDIES ON AFRICAN HETEROPTERA

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INTRODUCTION

The present article is based on material of Heteroptera from the Guinean subregion, kindly sent for examination by Dr. M. Boulard and Dr. J. Carayon (Paris), Dr. R. H. Cobben (Wageningen), and Dr. P. H. van Doesburg (Leiden). The author is greatly indebted also to Dr. W. R. Dolling, British Museum (Natural History), for the loan of the holotype of *Daladeropsis africana* (Dl.) and to Dr. G. Schmitz, Tervuren Museum, for the sending of material of *Hebrovelia usingeri* Ps.

The following new taxa are described: *Naboandelus bergevini bouakeanus* subsp.n., *Hynesionella cobbeni* sp.n., *Microvelia pilipes* sp.n., *M. troilos* sp.n., *Mesovelia dentiventris mollis* subsp.n., *Hebrovelia carayoni* sp.n., *Daladeropsis africana ampliata* subsp.n., *D. pelops* sp.n. and *Carbula melanacantha breviscutum* subsp.n.

1. MATERIAL OF AQUATIC AND SEMIAQUATIC HETEROPTERA FROM THE IVORY COAST COLLECTED BY R. H. COBBEN

Corixidae

Micronecta quewalepele Hc. — Bandama, several ex., IV.1964. Widespread (South Africa, Sudan, Ghana).

Micronecta scutellaris (St.) — Bouaké, several ex., 22—29.IV.1964. Widespread: the Ethiopian region, Egypt, Israel, India.

Stenocorixa protrusa Hv. — Bouaké, 1 ex., 22—23.IV.1964. Very common in the Sudan. Also known from Chad and the Congo.

Agraptocorixa dakarica J. — Bouaké, 4 ex., IV.1964. Known from West Africa, the Sudan, Kenya and the Congo.

Pleidae

Plea pullula (St.) — Bouaké, several ex., IV.1964. Widespread (Ethiopian region, Egypt, Israel).

Notonectidae

Anisops pellucens Gst. — Adiopodoumé, 1 ex., IV-V.1964; Jéalé, 2 ex., XII.1967 (P. J. Hummelen). Widespread: the Ethiopian region, Madagascar, S.W.Arabia.

Anisops adonis Hc. — Bouaké, 3 ex., 22—23.IV.1964. Known from Nigeria and the Sudan.

Anisops jaczewskii Hc. — Bouaké, 2 ♀ probably of this species, IV.1964. Widespread (West Africa, Chad, Sudan, Congo, East Africa, Southern Africa).

Anisops sardea (H.—S.) — Bouaké, 2 ex., IV.1964. Palaeotropical.

Anisops debilis debilis Gst. — Bouaké, 3 ex., IV.1964. Widespread in tropical Africa.

Anisops lanceolata Ps. — Lamto, 1 ex., 28.IV.1964. West Africa.

Enithares sobria St. — Adiopodoumé, 1 ex., IV—V.1964; Jéalé, 2 ex., XII.1967 (P. J. Hummelen). Widespread in the Ethiopian region, also known from Morocco.

Neonychia congoensis Hf. — Bouaké, 1 ex., IV.1964; Lamto, 1 ex., 29.III.1964. Previously known from Togo and the Congo, ssp. *soudani* Ps. from the Sudan.

Nychia limpida St. — Adiopodoumé, 2 ex., IV-V.1964. Palaeotropical.

Naucoridae

Naucoris obscuratus Mtd. — Adiopodoumé, 3 ex., IV-V.1964. Widespread in the Ethiopian region.

Belostomatidae

Hydrocyrius columbiae Spin. — Ivory Coast, 1 ex., 1957 (J. de Wilde). Nearly all Africa, Arabia.

Sphaerodema nepoides (F.) — Adiopodoumé, 1 ex., IV—V.1964; Bouaké, several ex., IV.1964. Widespread in tropical Africa.

Nepidae

Laccotrephes ater (L.) — Adiopodoumé, 1 ex., IV—V.1964. Widespread in tropical Africa.

Laccotrephes sp. probably new. — A small and narrow species. — Adiopodoumé, 1 ♀, IV—V.1964.

Ranatra parvipes vicina Sgn. — Adiopodoumé, several ex., IV—V.1964; Bouaké, 1 ex., 22—23.IV.1964. Nearly all Africa, Egypt, Israel.

Ranatra emaciata guineensis Ps. — Adiopodoumé, 4 ex., IV—V.1964. Guinean.

Gerridae

Rhagadotarsus (*Caprivia*) *hutchinsoni* Ch. — Adiopodoumé, 2 ex., IV—V.1964; Bouaké, 1 ex., IV.1964; Lamto, 1 ex., 28.IV.1964. Widespread in tropical Africa.

Naboandelus bergevini bouakeanus subspec. nov. (Fig. 1—3)

Length: forma macroptera 4 mm; forma aptera ♂ 2.25 mm; forma aptera ♀ 2.75—3 mm. Apterous ♂: Black with distinct metallic lustre. Lateral and basal margins of head narrowly, basal half of 1st antennal joint, circular median spot on pronotum, base of rostrum and bases of femora yellow-brown. Under surface of prothorax whitish. Apterous ♀: as male but yellow-brown markings more spread: margins of head rather broadly, entire 1st antennal joint, base of 2nd antennal joint, transverse middle spot on pronotum, inverted V-shaped obscure middle spot on base of mesonotum, apex of abdomen, venter and femora, excluding tips, yellow-brown. Macropterous form: colouring as in the apterous form but ♀ with basal margin of pronotum yellow-brown.

Robust, apterous ♀ especially, broadly ovate, distinctly broader than the nominate form.

Male genitalia: Lateral horns of 10th sternite long and acute (Fig. 1).

Material studied: Ivory Coast: Bouaké, 1 ♂ holotype, 3 paratypes and 1 larva, 14.III.1964; Grand Bassam, Mangrove, 1 paratype and 2 larvae, 14.III.1964. Holotype and paratypes in the author's collection, paratypes also in collection Laboratory of Entomology, Wageningen.

Other material: Nigeria: N. Bussa, 3 ♀ possibly of this species, 12.I.1970, J. Medler, author's collection.

The new race differs from the others in the long and acute lateral horns of the 10th sternite (Fig. 1—3).

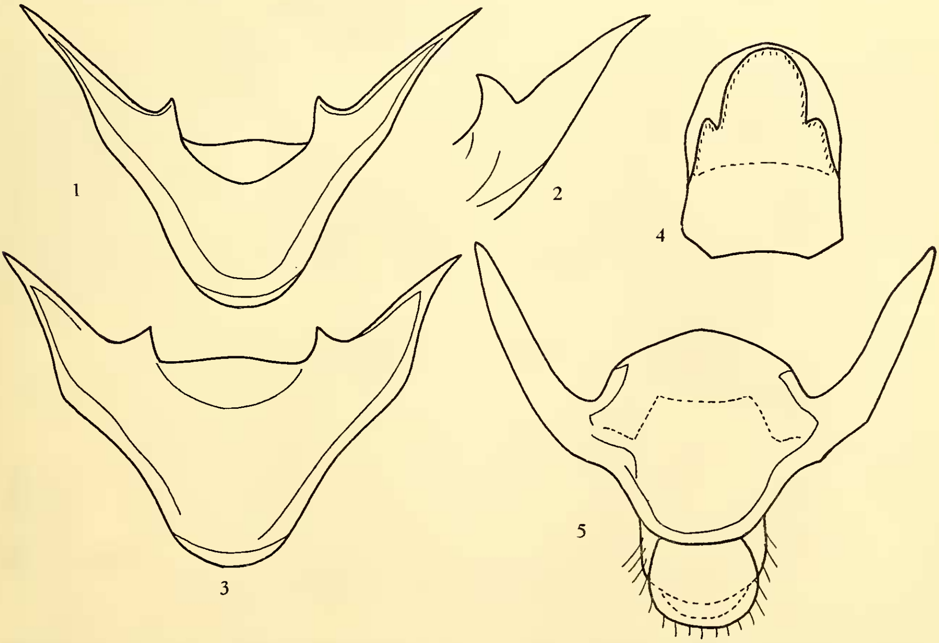


Fig. 1. *Naboandelus bergevini bouakeanus* subsp. n., 10th sternite. Fig. 2. *N. bergevini bergevini* Bgr. (Egypt), lateral horn. Fig. 3. *N. bergevini pygmaeus* Lv., 10th sternite. Fig. 4—5. *Hynesionella cobbeni* sp. n. 4, pygophore; 5, 10th sternite

Naboandelus bergevini bergevini Bgr. (Egypt, Libya) is black, the yellowish markings on the vertex and pronotum are very obscure, and the mesonotum, the antennae and the legs are always black, except the extreme base of the fore femora. The body is considerably narrow.

N. bergevini pygmaea Lv. (Sudan) is considerably smaller (length ♂ forma aptera 1.7—2 mm, ♀ forma aptera 2.4—2.5 mm, forma macroptera 3.75 mm) and narrower. The ground colouring is deep black. The pale markings are very scanty: the pale spots on the mesonotum are often absent, the hind legs are totally black and the fore and middle femora broadly blackened apically.

N. bergevini popovi Brw. (Israel, Arabia) resembles the new subspecies in the size, body form and general colouring, but differs in the dark hind legs and the shape of the 10th sternite (similar as in the nominate form). Moreover the pale spots on the mesonotum are generally not confluent medially. The macropterous form is considerably more robust.

Hynesionella cobbeni spec. nov. (Fig. 4—10)

Length ♂ 2 mm, ♀ 2.5—2.75 mm. Opaque. Black. Lateral margins of vertex brownish. Eyes reddish brown. Antennae black. Pronotum with yellow-brown median spot. Broad median band on mesonotum and base of dorsum of abdomen greyish blue. Also flanks with greyish blue markings. Legs black.

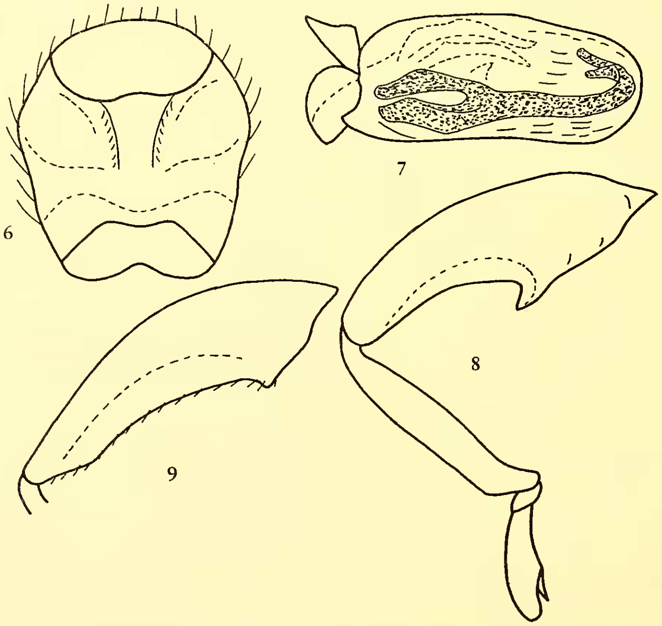


Fig. 6—9. *Hynesionella cobbeni* sp. n. 6, 8th abdominal segment, ventral aspect; 7, penis, lateral aspect; 8, fore leg (♂); 9, fore femur (♀)

Body short and robust (Fig. 10), about 1.7 times as long as broad. Hair-cover dense, adpressed, greyish. Ocular index 2.25—2.29. Antennae appearing short and relatively incrassate, 1st joint curved, 4th club-shaped, proportions of joints 25:23:18:20 (diatone

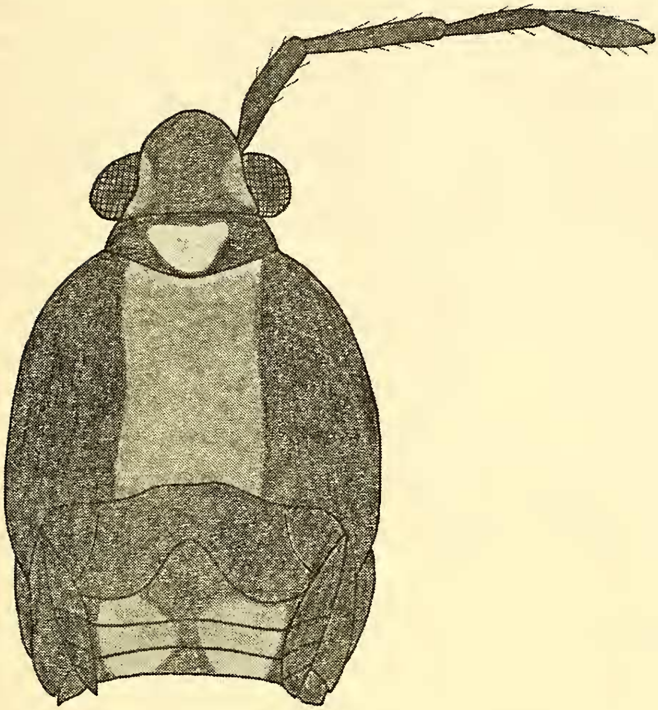


Fig. 10. *Hynesionella cobbeni* spec. nov.

45 units) in ♂, 26:20:18:21 (diatone 51 units = 0.015 mm) in ♀. Rostrum extending beyond fore coxae. Pronotum with anterior margin nearly straight, lateral margins short and strongly diverging caudad, basal margin nearly semicircular. Lateral margins of mesonotum distinctly curved, antero-lateral angles roundedly prominent, disk concave with a faint median keel, intersegmental suture between mesonotum and metanotum distinctly raised. Abdomen broadly conical, connexivum strongly reflexed. Legs appearing relatively short. Fore femur (Fig. 8—9) in ♂ incrassate with a strong tooth on caudal margin, in ♀ more slender, caudal margin with a small subbasal knob.

Measurements of legs (1 unit = 0.015 mm)

		♂			♀	
	femur	tibia	tarsus	femur	tibia	tarsus
fore	40	31	4 + 14	46	35	4 + 18
middle	80	126	80	100	148	95
hind	93	37	18	102	45	24

Male genitalia, Fig. 4—7.

Material studied: Ivory Coast: Adiopodoumé, 1 ♂ holotype, 2 ♀ paratypes, IV—V. 1964. Holotype and one paratype in author's collection, paratype in coll. of the Laboratory of Entomology, Wageningen.

The genus *Hynesionella* Ps. is closely related to *Naboandelus* Dist. differing mainly in the more robust body, the shorter extremities and the dentate anterior femora of the male (edentate in *H. omercooperi*). Two species of the genus have hitherto been described: *H. aethiopica* Ps. from Ethiopia and *H. omercooperi* Hf. & Mats. from South Africa. The latter is easily recognized by the edentate anterior femora. *H. aethiopica* is more robust, length 3 mm ♂, 3.25 ♀, the main colouring is bluish grey, the pronotum is longer and broader with the anterior margin curved and the lateral margins longer and less diverging caudad, the antennae are longer, the tooth of the anterior femora is smaller, etc.

The new species from the Ivory Coast is interesting from zoogeographical point of view because it indicates that the range of the genus is considerably larger than previously assumed.

Veliidae

Rhagovelia maculata Dist. — Adiopodoumé, 4 ex., IV—V.1964; Bouaké, 2 ex., 22—23.IV.1964. Widespread in tropical Africa.

Rhagovelia aeneipes Hgl. — Bouaké, several ex., 22—23.IV.1964. Known from West Africa, Congo, Sudan and S. Ethiopia.

Microvelia gracillima Rt. — Numerous ex. from Adiopodoumé. IV—V.1964 and Bouaké, 22—23.IV.1964. Nearly all Africa, Egypt, Israel, Madagascar.

Microvelia waelbrocki Kk. — Bouaké, 4 ex., 22—23.IV.1964; Lamto, 1 ex., 28.IV. 1964. Widespread in tropical Africa. Also known from Egypt.

Microvelia major Ps. — Bandama, 2 ex., IV.1964. Nearly all Africa, Arabia.

Microvelia (Trichovelia) pilipes spec. nov. (Fig. 11—18)

♂ forma aptera. Length 2 mm. Opaque. General colouring blackish brown. Head dark brown, margins slightly paler. Eyes reddish brown. Antennae dark brown. Pronotum coffee-brown, anterior margin with a transverse yellow-brown band. Connexivum dark yellow-brown, medio-basal angles of segments darkened. Lateral margins of venter and rostrum yellow-brown. Legs dark yellow-brown, femora pale ochraceous basally.

Small and narrow, 3.1 times as long as broad. Hair covering dense, longish, semidecumbent, brownish. Pronotum and dorsum of abdomen with patches of silvery adpressed pubescence. Head (Fig. 11) 0.75 times as broad as pronotum, convex, vertex with a faint median sulcus, ocular index 2.6. Antennae appearing long, 1st joint rather incrassate and recurved, with a few long erect setae, hair covering of antennae otherwise smooth; proportions between joints 23:17:2:16:25 (diatone 30 units). Pronotum 1.74 times as broad as long, lateral margins curved, hind margin truncate; disk flattish with a faint transverse impression at middle, puncturing rather sparse and obsolete. Meso- and metanotum visible as small triangular lateral lobes. Abdomen narrowly conical, connexivum distinctly upcurved. Fore legs (Fig. 12): femur rather incrassate, hair covering short; tibia broadening apicad, inner surface with remarkably long hairs, obliquely directed latero-apicad, hair covering of other parts of the common type, comb short, 0.31 times as long as tibia. Middle legs of the common type, hair covering short. Hind legs (Fig. 13): femur moderately incrassate, slightly curved apically, hair covering short; tibia distinctly reflexed owing to a roundish subbasal expansion on inner margin,

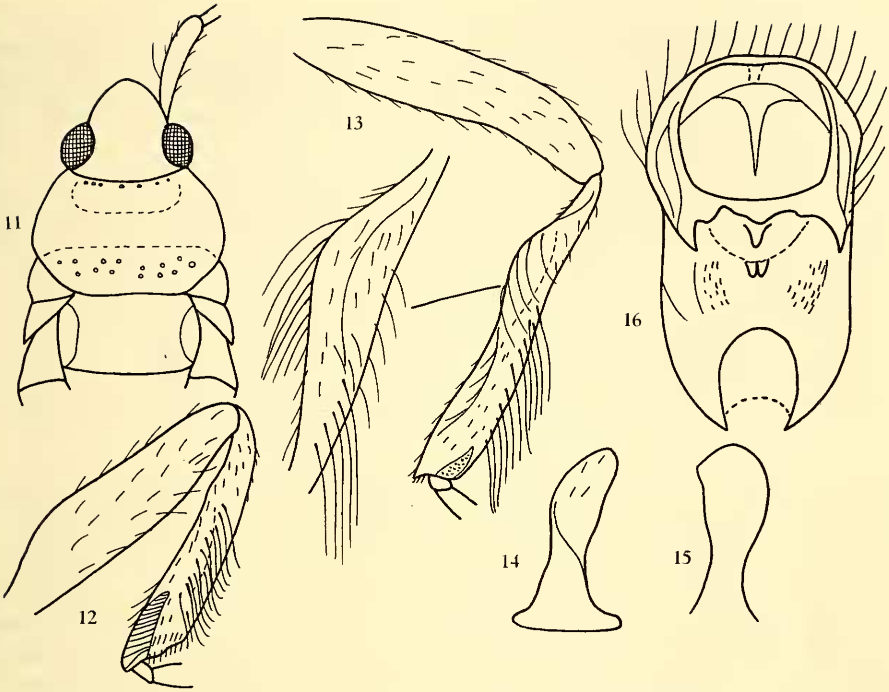


Fig 11—16. *Microvelia pilipes* sp. n. 11, head and thorax; 12, fore leg (♂); 13, hind leg (♂); 14—15, styli; 16, 8th abdominal segment (♂), ventral aspect

Measurements of legs (1 unit = 0.015 mm)

	femur	tibia	tarsus
fore	35	32 (comb 10)	16
middle	40	40	7 + 16
hind	42	50	7 + 16

apical part of tibia flattened, expansion and apical part of outer margin with numerous very long hairs, hair-cover otherwise short.

Male genitalia, Fig. 14—18. Ventral surface of 8th abdominal segment medially concave and provided with 3 tubercles. Styli very small.

♀ forma aptera. Length 2.3—2.7 mm. Resembling ♂. Head yellowish brown, median sulcus and a longitudinal dash on either side of vertex dark fuscous.

Hair-cover longer than in ♂. Head about 0.83 times as broad as pronotum; ocular index about 1.78. Proportions of antennal joints 24:17:2:18:25 (diatone 34 units), 1st joint rather incrassate and recurved, with a few long bristles, hair covering of antennae otherwise semidecumbent, longer than in ♂, longest hairs of 3rd joint longer than diameter of the joint. Pronotum about 1.7 times as broad as long at middle, puncturing dark and coarser than in ♂. Sides of abdomen strongly erected dorso-mesad, touching or nearly touching each other medially, dorsum therefore concealed, excluding a narrow midline, from 3rd tergite to tip of abdomen. Apex of abdomen obliquely vertical in profile (as in *M. troilos*); hair covering of connexivum of normal type. Legs incrassate, hair covering semidecumbent, longish, dense. Fore and middle femora slightly curved, tibiae straight. Fore tibiae thick, expanding apicad, hair covering normal. Hind femora shallowly curved; tibiae a little reflexed, outer margin with longish erect hairs, hair covering otherwise semidecumbent or smooth.

Measurements of legs (1 unit = 0.015 mm)

	femur	tibia	tarsus
fore	37	33	18
middle	45	44	7 + 18
hind	47	54	8 + 19

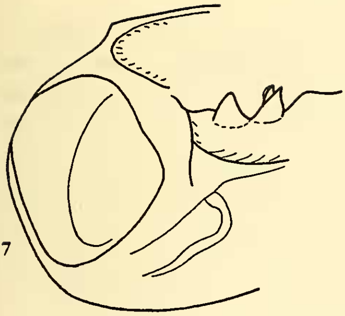
Material studied: Bouaké, IV.1964. 1 ♂ holotype and 3 ♀ paratypes in author's collection, 1 ♂ and 5 ♀ in coll. of the Laboratory of Entomology, Wageningen.

A distinctive species. Of the subgenus *Trichovelia* Hob., recognized by the long hair-cover and the structure of the hind legs, two species are known, *M. machadoi* Hob. from Angola and *M. urundii* Ps. from Urundi (= Burundi). *M. machadoi* is distinguished by the long hair-cover of the antennae, the long comb of the fore tibiae and the structure of the male genitalia. *M. urundii* is bigger, length 3.3 mm, the antennae are provided with long erect hairs.

Microvelia (Trichovelia) troilos spec. nov. (Fig. 19—25)

Fig. 19. Forma aptera. Length ♂ 1.6—2.0 mm, ♀ 2.75 mm. Head yellow-brown, tylus brown, frons often with a brown midline, eyes reddish grey. Antennae blackish. Pronotum yellow-brown, basal part usually slightly embrowned and provided with a pale midline, puncturing black. Lateral lobes of meso- and metanotum yellow-brown, transverse segmental margins weakly embrowned. Dorsum of abdomen dark brown, 1st tergite with a faint pale midline, last tergite yellowish brown. Connexivum yellowish brown, transverse segmental margins embrowned. Under surface blackish, segmental margins of thorax pale, lateral margins of venter yellowish brown. Base of rostrum pale, apex black. Legs dark coffee-brown, coxae and bases of femora pale.

Body robust as in *M. major* Ps., 2.3—2.7 times as long as broad. Head convex, with a faint median sulcus, hair covering semidecumbent, brownish; ocular index 3.3—3.8. Antennae appearing relatively short and thick, especially in ♂, 1st joint distinctly curved, with a few long erect bristles, 2nd joint slightly expanding apicad, hair covering semidecumbent; proportions between joints 18:13:2:13:19 (diatone 30.5 units) in ♂, 25:19:2:18:24 (diatone 38.5 units) in ♀. Pronotum 1.4 (♂) or 1.6 (♀) times as broad as long, lateral margins curved, apical margin shallowly insinuated, basal margin roundedly truncate; puncturing remarkably coarse and sparse, callal area and a midline on disk impunctate; hair covering on lateral areas long, erect and dark, on median parts short and smooth, callal area with silvery pubescence. Meso- and metanotum visible as triangular lateral lobes, hair covering smooth and partly silvery, also long erect dark hairs present. Abdomen rather broadly conical, connexivum in ♂ moderately,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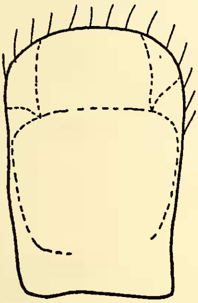
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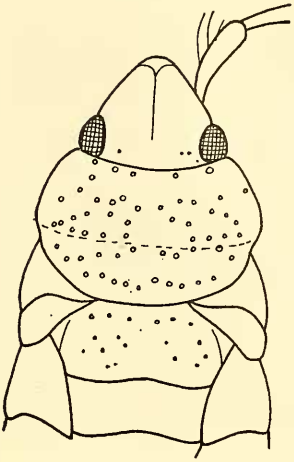
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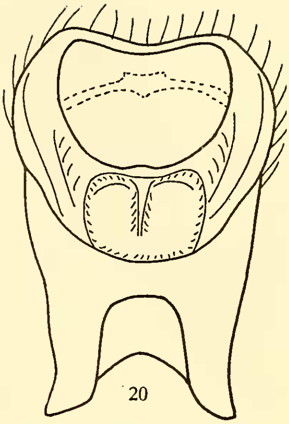
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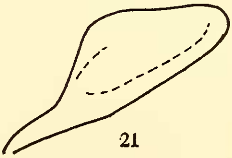
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Fig. 17—18. *Microvelia pilipes* sp. n. 17, 8th abdominal segment (♂), obliquely from side; 18, genital capsule (♂) from below. Fig. 19—21. *M. troilos* sp. n. 19, head and thorax; 20, 8th abdominal segment (♂), ventral aspect; 21, stylus

in ♀ strongly upcurved; 1st tergite with a few coarse punctures; hair-cover short, adpressed and brownish, silvery pubescence abundant. Hair-cover of under surface adpressed, coarsely punctate margins of prothorax with long erect black hairs. Legs incrassate, hair covering semidecumbent, dense. Fore tibia (♂) (Fig. 22) straight, comb 0.53 × as long as tibia. Hind tibia (♂) straight.

Measurements of legs (1 unit = 0.015 mm)

		♂			♀	
	femur	tibia	tarsus	femur	tibia	tarsus
fore	33	30 (comb 16)	17	45	41	24
middle	37	38	7 + 15	52	54	9 + 21
hind	40	46	8 + 15	58	65	11 + 21

Male genitalia, Fig. 20—21, 23—24. Ventral surface of 8th abdominal segment with a roundish median depression. Styli small. Apex of abdomen (♀) (Fig. 25) obliquely vertical in profile.

♀ forma macroptera. Length 2.75 mm. General colouring as in the apterous form. Pronotum bicoloured: dark brown with anterior margin and a narrow, basally indistinct midline, yellowish brown, also lateral margins narrowly pale. Elytra black, corium with two milky basal spots, the lateral one large (pattern as in *M. urundii* Poisson, 1955, p. 396, Fig. 2B), membrane uniformly dark.

Body short and broad, 2.2 times as long as broad, broadest at humeral angles of pronotum, distinctly tapering caudad. Head 0.51 times as broad as pronotum; ocular index 3.0. Pronotum 1.2 times as broad as long at middle, lateral margins straight, strongly diverging caudad, humeral angles blunt, caudal prolongation broadly parabolic; disk moderately convex, sloping both apicad and caudad, the pale areas impunctate, puncturing otherwise fine and relatively sparse, distance between punctures distinctly longer than diameter of a puncture; anterior margin with a puncture; anterior margin with a puncture row, interrupted at middle. Elytra a little shorter and narrower than abdomen, tip of abdomen and lateral margins of connexivum therefore visible (as e.g. in *M. major* Ps. (= *tchanialis* Ps.) in Poisson, 1941, p. 185, Fig. 31). Puncturing of under surface of thorax rather fine. Other characters as in the apterous form.

Material studied: Bouaké, 1 apterous ♂ holotype and 18 apterous ♂, 19 apterous ♀ and 2 macropterous ♀ paratypes, IV.1964. Holotype and paratypes in author's collection, paratypes also in coll. of the Laboratory of Entomology, Wageningen.

KEY TO THE SPECIES OF THE SUBGENUS *Trichovelia* HOB.

1 (6) Apterous forms 2

2 (5) ♂: Hind tibiae reflexed, inner surface with a subbasal roundish expansion with a tuft of very long hairs. ♀: Sides of abdomen strongly upcurved, concealing dorsum of abdomen, at least apically 3

3 (4) Only 1st antennal joint with long erect bristles. ♂: Length 2 mm. Comb of fore tibiae short, only 0.31 times as long as tibia. ♀: The upcurved lateral margins of abdomen concealing dorsum from 3rd tergite to tip of abdomen; hair covering of paratergites normal . . . . *pilipes* sp.n.

4 (3) All antennal joints with long erect bristles. ♂: Length 2.28 mm. Comb of fore tibiae slightly shorter than half of tibial length. ♀: Upcurved lateral margins of abdomen concealing dorsum only apically from tergite 5 to tip of abdomen; 6th paratergite with a tuft of long erect bristles . . *machadoi* Hob. (Angola)

5 (2) ♂: Hind tibiae straight, without a tuft of long hairs. ♀: Sides of abdomen only moderately upcurved . . . . *troilos* sp.n.

6 (1) Macropterous forms (♀) 7

7 (8) Length 3.3 mm. Body about 2.5 times as long as broad. Pronotum black, only humeral angles reddish . . . . *urundii* Ps. (Urundi)

8 (7) Length 2.75 mm. Body 2.2 times as broad as long. Pronotum more largely bicoloured . . . . *troilos* sp.n.

Mesoveliidae

Mesovelia vittigera Hv. — Adiopodoumé, 1 ex., IV—V.1964; Bouaké, several ex., 22—23.IV.1964. Paleotropical.

Mesovelia dentiventris Lv. **mollis** subspec. nov. (Fig. 26—27)

Forma aptera. Length ♂ 3.75—4 mm, ♀ 4.25—4.5 mm. Resembling the nominate form from the Sudan but paler: yellow-brown; apex of head dark; antennae and legs with faint infuscation; tarsi bicoloured with 1st joint pale and 2nd dark. The nominate form is darker yellowish brown with the antennae and legs dark brown. The tarsi are dark with the 1st joint only indistinctly pale.

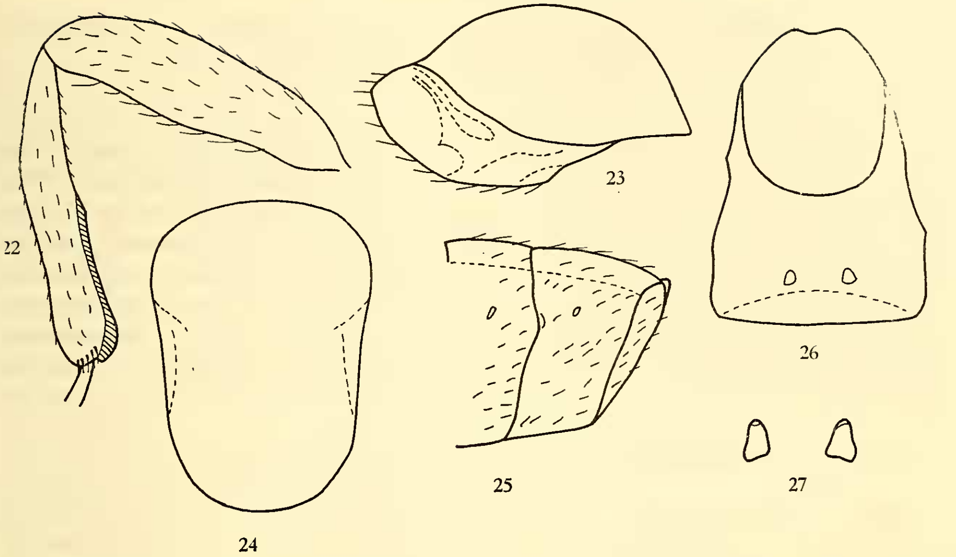


Fig. 22—25. *Microvelia troilos* sp. n. 22, fore leg (♂); 23, 8th abdominal segment (♂) from side; 24, genital capsule (♂) from below; 25, apex of abdomen (♀) in profile. Fig. 26—27. *Mesovelia dentiventris.* 26, *M. d. mollis* subsp. n., 8th abdominal segment (♂), ventral aspect; 27, *M. d. dentiventris* Lv., tubercles of 8th abdominal segment (♂)

Body more gracile than in the nominate form. Teeth on ventral surface of 8th abdominal segment (Fig. 26—27) much smaller.

Measurements (1 unit = 0.015 mm)

Proportions between antennal joints 21:15:21:21 (diatone 18.5) in ♂, 20:15:21:21 (diatone 18.5) in ♀.

		♂			♀	
	femur	tibia	tarsus	femur	tibia	tarsus
fore	31	24	4 + 4	30	23	4 + 4
middle	40	37	7 + 5	40	38	8 + 6
hind	50	65	10 + 6	50	67	10 + 6

Material studied: Ivory Coast: Boaké, 1 ♂, holotype and 3 paratypes, IV.1964. Holotype in author's collection, paratypes in coll. of the Laboratory of Entomology, Wageningen.

Hydrometridae

Hydrometra aegyptia chabanaudi Hf. & Ev. — Port Bonet, 1 ex., 14.IV.1964. Range: Sudan.

Hydrometra albolineolata Rt. — Adiopodoumé, 2 ex., IV—V.1964; Bouaké, 3 ex., 22—23.IV.1964; Lamto, 1 ex., 20.IV.1964. All Africa S. of the Sahara.

Hydrometra chopardi Ps. — Adiopodoumé, 1 ex., IV—V.1964. Guinean.

Hydrometra rhodesiana Hf. & Ev. — Lamto, 1 ex., 28.IV.1964. Known from West Africa, the Sudan and East Africa (Rhodesia).

2. A new species of the genus *Hebrovelia* Lbl. (Het. Veliidae, Hebroveliinae) from the Central African Republic

The genus *Hebrovelia* was described by Lundblad (1939), who regarded it as a representative of a new family, Hebroveliidae, differing from the closely related Veliidae in the apical claws (preapical in Veliidae). Later on, China & Usinger (1948) stated that also certain Veliidae genera have apical claws, and that Hebroveliidae undoubtedly are a subfamily of that family. The subfamily, which has an isolated position within Veliidae, has a Guinean range. The following species and races have hitherto been described: *H. singularis* Lbl. (Nigeria), *H. usingeri usingeri* Ps. (Cameroon), *H. usingeri congoensis* Ps. (Zaire) and *H. usingeri collarti* Ps. (Zaire and Congo (Brazzaville)). An additional species, *H. carayoni* from the Central African Republic, is described below.

Hebrovelia carayoni spec. nov. (Fig. 28—36)

Forma microptera. Length 4.25 mm. Opaque. Reddish brown. Tylus shiny, apex and sides of frons yellowish brown, vertex with two very small black pits. Eyes reddish brown. Antennae dark yellow-brown. Margins of pronotum rather broadly yellowish brown, puncturing black. Elytral rudiments whitish. Dorsum of abdomen with a broken midline of yellowish brown spots, each paratergite with a triangular pale spot, puncturing dark. Rostrum yellow-brown, tip black. Sides of thorax largely black. Venter with a broad black longitudinal band on either side, also the punctured areas at middle of sternites rather darkened. Legs yellow-brown. A ring and extreme tip of femora brown.

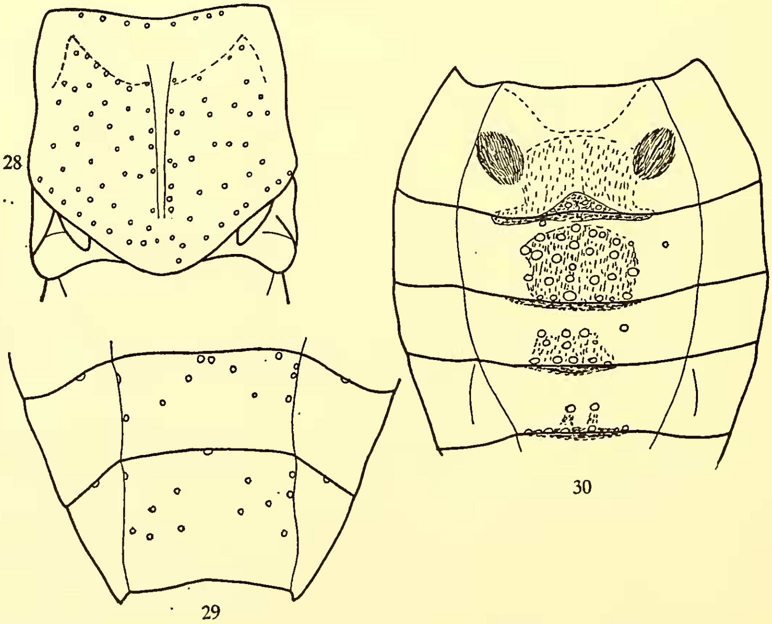


Fig. 28—30. *Hebrovelia carayoni* sp. n. 28, thorax; 29, last tergites; 30, venter

Of the common shape of the genus but remarkably gracile, body 3.4 times as long as broad. Hair-cover on upper surface dense, adpressed, brownish and relatively short, on under surface longish. Head slightly broader than pronotum (73: 71), convex, sloping both apicad and basad, with 3 small trichobothria and a round black pit on either side, a narrow median sulcus present. Proportions between antennal joints 25:21:(4):48:(2):45, 1st joint distinctly curved, provided with adpressed hairs and a few longish bristles, hair covering of 2nd joint adpressed, other joints with long erect bristles. Pronotum (Fig. 28) broader than long at middle (71:65), nearly parallel-sided, hind margin semicircular, callal area and middle of basal part slightly elevated, a relatively distinct median keel present; puncturing sparse and rather fine, callal area and lateral margins impunctate. Elytral rudiments very small, scale-like. Tergites (Fig. 29) with only scattered and small punctures, in one specimen the punctures forming irregular transverse rows; paratergites with 1—2 punctures. Sides of thorax rather densely punctate. Middle of venter (Fig. 30) depressed, structure otherwise as mentioned in the following table, the black lateral bands with coarse puncturing, parasternites impunctate. Legs (Fig. 35—36) of the common type in the genus.

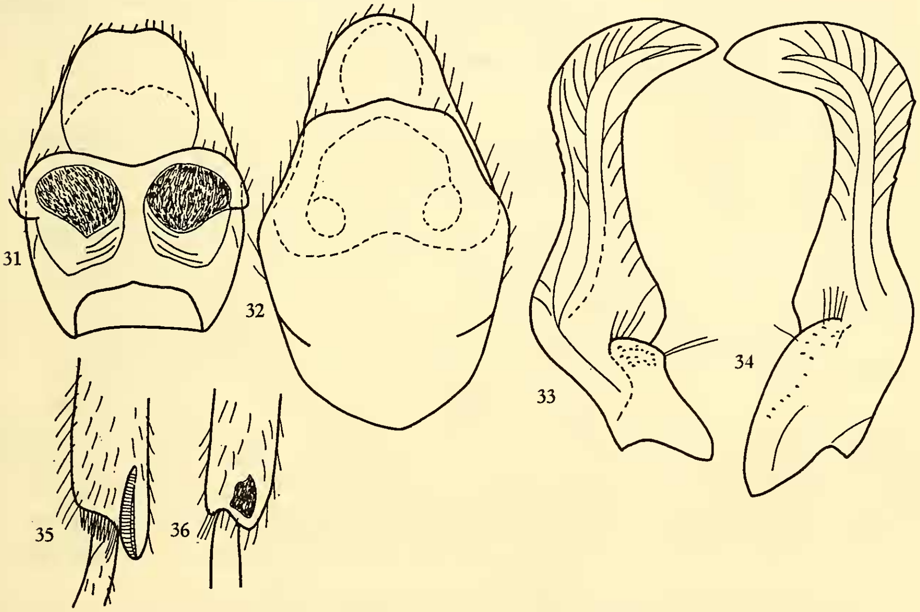


Fig. 31—36. *Hebrovelia carayoni* sp. n. 31, 8th abdominal segment, ventral aspect; 32, genital capsule and anal conus, ventral aspect; 33—34, stylus; 35, apex of fore tibia; 36, apex of hind tibia

Measurements of legs (1 unit = 0.015 mm)

	femur	tibia	tarsus
fore	76	67 (comb 10)	31
middle	88	85	22 + 18
hind	103	108 (brush 6)	38 + 26

Male genitalia, Fig. 31—34.

Material studied: Central African Republic: Boukoko, grotte de Bébé, 1 ♂, holotype, in the Paris Museum, and 3 ♂ paratypes, in author's collection, VI.1964, J. Carayon.

The main distinguishing characters of the species are indicated in the following table.

singularis	*usingeri*	*carayoni*
1. macropterous	1. usually macropterous	1. brachypterous
2. puncturing of dorsum very dense and coarse, also paratergites with several punctures (Lundblad, 1939, Pl. 2 Fig. 3)	2. puncturing of dorsum finer and rather abundant, paratergites often with 4 punctures.	2. puncturing of dorsum very remote, paratergites with 1—2 punctures.
3. depressed median part of venter: 7th sternite: black setigerous tufts very small lying in caudal margin (Poisson, 1950, Fig. 10)	3. 7th sternite: black setigerous tufts large, less compact (Poisson, 1950, Fig. 9, 11 and 12)	3. 7th sternite: black setigerous tufts of moderate size, compact.
6th sternite: with remote puncturing.	6th sternite: 3—4 small punctures at middle.	6th sternite: coarsely and densely punctate and darkened at middle.
5th sternite: puncturing remote	5th sternite: 1 puncture at middle	5th sternite: with several punctures at middle
4th sternite: ?	4th sternite: impunctate at middle	4th sternite: with 2 punctures at middle.
3rd sternite: ?	3rd sternite: with about 6 remote punctures.	3rd sternite: impunctate.
4. 8th abdominal segment: narrowly conical, setigerous brushes of moderate size (Lundblad, 1939, Fig. 2 g).	4. 8th abdominal segment: narrowly conical, black setigerous brushes very large (Poisson, 1950, Fig. 9e, 11 c and 12d).	4. 8th abdominal segment: broader, apical margin slightly insinuated, black setigerous brushes largish.
5. Apex of stylus weakly recurved, blunt (Lundblad, 1939, Fig. 2k).	5. Stylus as in *H. singularis.*	5. Apex of stylus strongly recurved and rather sharp.

3. ON THE GENUS *Daladeropsis* KARSCH (COREIDAE, COREINAE, DALADERINI)

Of the Guinean genus *Daladeropsis* Karsch three species are known: *D. africanus* (Dl.), widespread within the Guinean subregion, and *D. hutereauae* Scht. and *D. dispar* Scht. in central southern Zaire. In material of various Heteroptera from the Central African Republic, sent by Dr. M. Boulard, of Paris, a new species, *D. pelops*, was detected.

D. africana and *D. pelops* are close relatives having large wing-shaped humeral lobes of the pronotum and a strongly expanded, nearly circular abdomen. They represent so the basic type of the tribe *Daladerini,* the centre of origin of which is in the Oriental region, apparently in S.E. Asia. In the two southern species, *D. hutereauae* and *D. dispar,* a tendency to reduction of the humeral lobes and narrowing of the abdomen is seen. Both species are without doubt derivatives of the *africana* stock; *D. hutereauae* has even retained certain *africana* features like the distinct tuberculation and the insinuated lateral margins of the pronotum.

Key to the species

1 (4) Humeral lobes of pronotum (Fig. 60, 65) directed laterad nearly horizontal, blunt. Antennae and legs appearing short, 1st antennal joint about 1.5 times as long as diatone. Abdomen elongately ovate. Small species, length < 30 mm 2

2 (3) Humeral lobes of pronotum (Fig. 60) dark, wing-shaped, lateral margins distinctly insinuated in front of them, remotely and coarsely dentate. 3rd antennal joint (Fig. 62—63) distinctly clavate. Medioventral process of pygophore (Fig. 68) broad and straight. Stylus (Fig. 69) broad . . . . . *hutereauae* Scht.

3 (2) Humeral lobes of pronotum (Fig. 65) not darkened, roundedly triangular, lateral margins in front of them straight, finely serrate. 3rd antennal joint (Fig. 64) narrow. Medio-ventral process of pygophore (Fig. 66) digitate, recurved caudad. Stylus (Fig. 67) narrow. . . . . *dispar* Scht.

4 (1) Humeral lobes of pronotum (Fig. 37, 40, 45, 55) prominent, wing-shaped, ± upcurved, distinctly recurved apicad. Antennae and legs long, 1st joint about twice as long as diatone. Abdomen strongly expanded, nearly circular in outline. Large species, length about 30 mm or more 5

5 (6) Length 33 mm. Humeral lobes of pronotum (Fig. 53) rather small, body appearing therefore narrowish. 1st antennal joint 1.25 times as long as 2nd. Hind femur (Fig. 51) incrassate, 5 × as long as broad, hind tibia much shorter than femur (51:61). Pygophore (Fig. 53) narrowish, apical margin rounded, medio-ventral process (Fig. 48) very short and broad . . . . *pelops* sp.n.

6 (5) Length about 30 mm. Humeral lobes of pronotum (Fig. 37, 40, 45) more prominent, body appearing broad. 1st antennal joint only slightly longer than 2nd. Hind femur (Fig. 49—50) somewhat slenderer, tibia longer. Pygophore (Fig. 52) broad, truncate apically; medioventral process (Fig. 46—47) long, triangular . . . . *africana* (Dl.)

Daladeropsis africana (Dl.) (Fig. 37—47, 49—50, 52, 56—57)

This widespread species seems to consist of two races distinguished as follows:

africana africana	*africana ampliata* ssp.n.
1. head (Fig. 38) in ♀ parallel sided in front of eyes, antennal tubercles large.	1. head (Fig. 39) in ♀ tapering apicad, antennal tubercles smaller.
2. 3rd antennal joint (Fig. 43—44) longer, moderately flattened, upper margin in narrow aspect subacute.	2. 3rd antennal joint (Fig. 41—42) shorter and strongly flattened, distinctly clavate, upper margin in narrow aspect sharp and shiny.

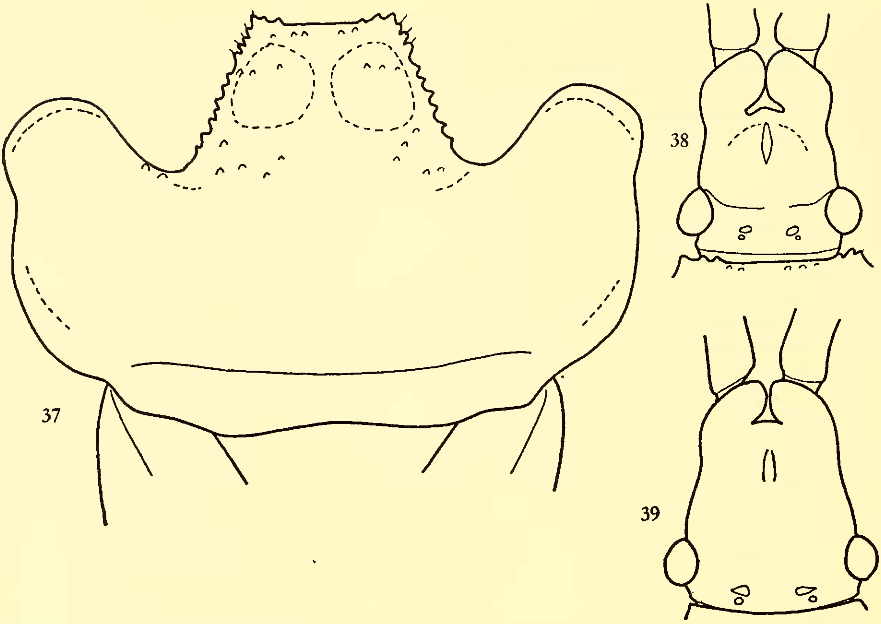


Fig. 37—38. *Daladeropsis a. africana* (Dl.), type ♀. 37, pronotum; 38, head. Fig. 39. *D. africana ampliata* subsp. n., head (♀)

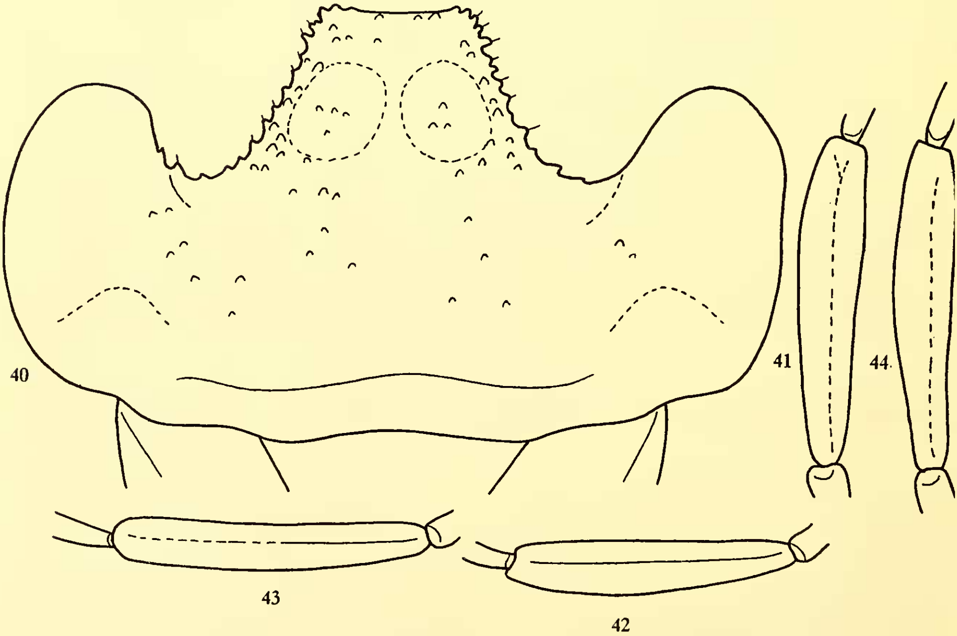


Fig. 40—42. *Daladeropsis africana ampliata* subsp. n. 40, pronotum (♀); 41, 3rd antennal joint (♀); 42, same (♂). Fig. 43—44. *D. africana africana* (Dl.) (Cameroon). 43, 3rd antennal joint (♂); 44, the same (♀)

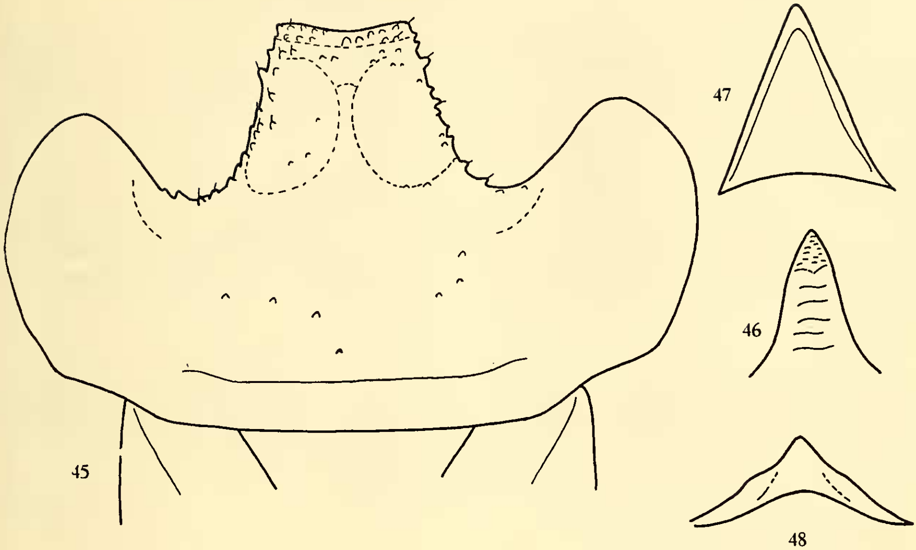


Fig. 45—47. *Daladeropsis africana.* 45—46, *D. a. ampliata* subsp. n.; 45, pronotum; 46, medioventral process of pygophore; 47, *D. a. africana* (Dl.) (Cameroon), medio-ventral process of pygophore. Fig. 48. *D. pelops* sp. n., the same

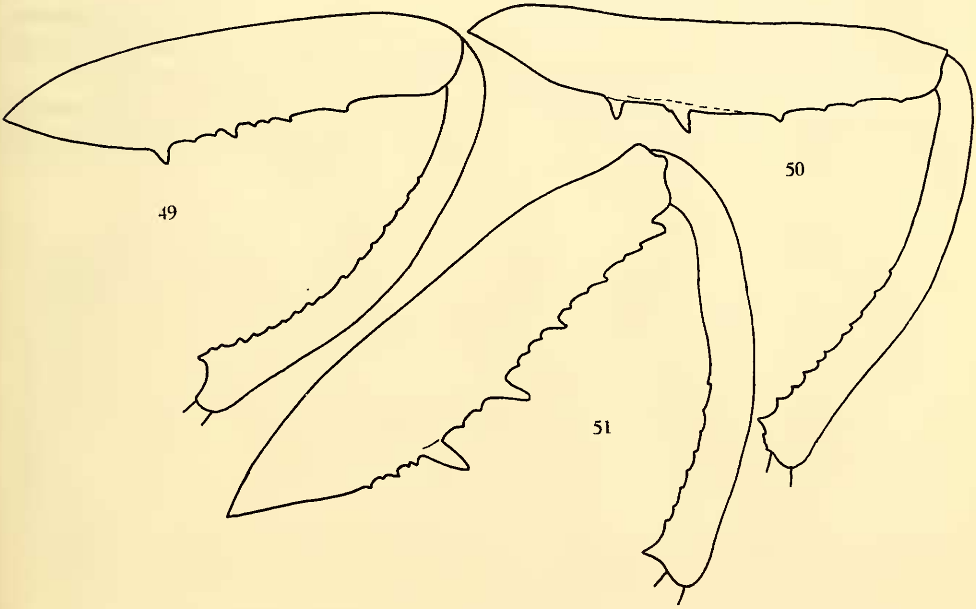


Fig. 49—51. Hind legs of ♂. 49, *Daladeropsis africana africana* (Dl.) (Cameroon); 50, *D. africana ampliata* subsp. n.; 51, *D. pelops* sp. n.

(*africana africana*)	(*africana ampliata*)
3. humeral lobes of pronotum (Fig. 37) generally rather weakly produced, approaching in shape to that of *D. pelops*.	3. humeral lobes of pronotum (Figs. 40, 45) generally strongly produced, wing-shaped.
4. tuberculation of venter rather weak and nearly concolorous.	4. tuberculation of venter coarse and ± dark.
5. hind tibia distinctly shorter than femur; hind femur in ♂ thicker (Fig. 49), tuberculation on posterior surface weaker.	5. hind tibia nearly as long as femur; hind femur in ♂ (Fig. 50) thinner, tuberculation on posterior surface stronger.
6. puncturing on ventral surface of pygophore rather sparse; medio-ventral process (Fig. 47) broad, triangular.	6. puncturing on ventral surface of pygophore very dense, rather confluent; medio-ventral process (Fig. 46) narrower.
7. range: northern coastal area of the Bay of Guinea.	7. range: Congo.

Both races seem to be connected by intermediates: in one female from Joko, Cameroon, the humeral lobes of the pronotum are fairly prominent, while in a female from Kafakumba, Katanga, they are as short as in the nominate form.

Material studied:

D. africana africana (Dl.): Sierra Leone, 1 ♀, holotype, in the British Museum; Cameroon: Joko, S. Cameroon, 2 ♀, A. Heyne, and Victoria, 1 ♂, in Mus. Leiden. In Mus. Leiden there is also a female with an incorrect locality label "Java".

D. africana ampliata ssp.n.: Zaire, Meshe, 1 ♂, holotype, 2—4.VI.1949, R. Laurent; Lulua, Kapanga, 1 ♀ paratype, X.1939, F. Overlaet, in the author's collection; Katanga, Kafakumba, 1 ♀ paratype, I.1924, E. le Moult, Mus. Leiden.

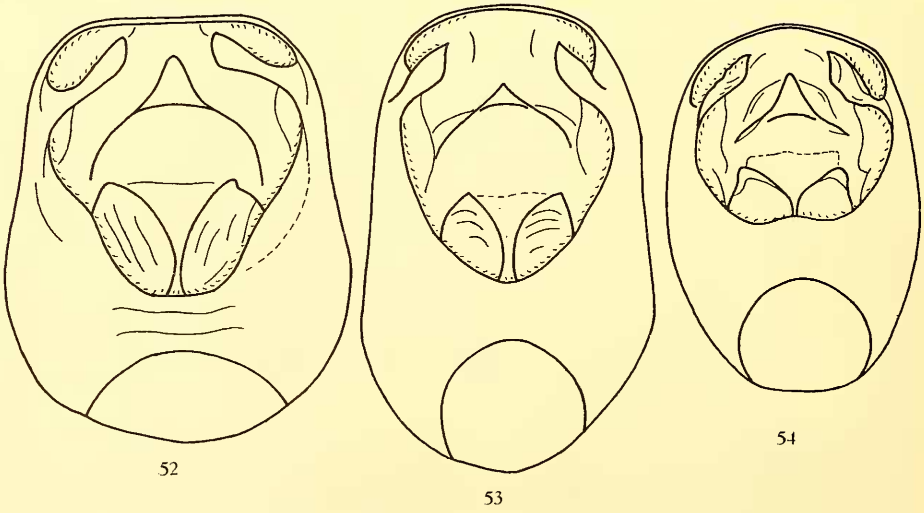


Fig. 52—54. Pygophore (♂). 52, *Daladeropsis africana ampliata* subsp. n.; 53. *D. pelops* sp. n.; 54, *D. hutereauae* Scht. (type)

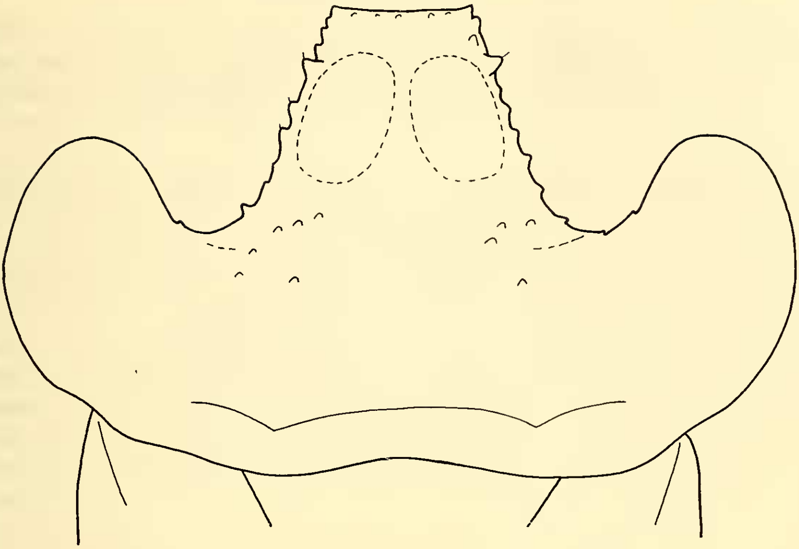


Fig. 55. *Daladeropsis pelops* sp. n., pronotum

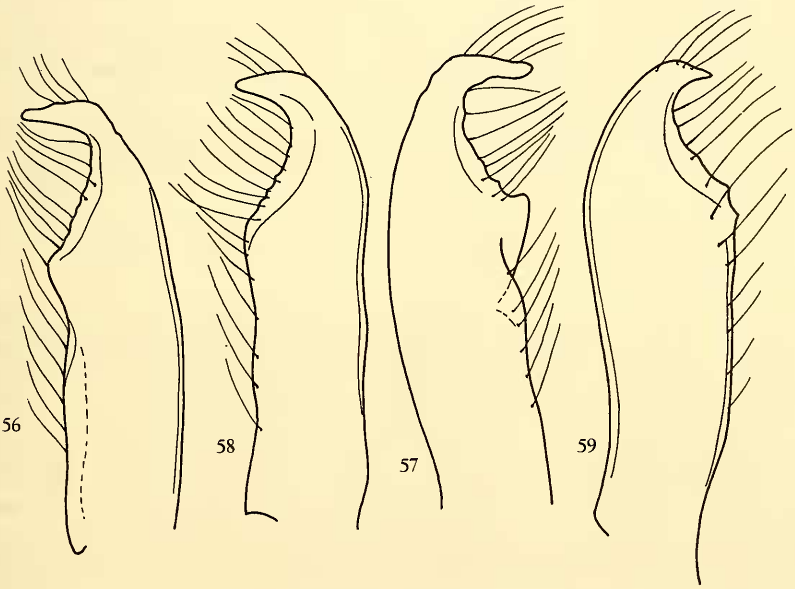


Fig. 56—59. Styli. 56—57, *Daladeropsis africana ampliata* subsp. n., 58—59, *D. pelops* sp. n.

Daladeropsis pelops spec. nov. (Fig. 48, 51, 53, 55, 58—59)

Length 33 mm, greatest breadth 17 mm. Subopaque. Reddish brown. 1st and 2nd antennal joints (others absent) black. Tubercles on lateral margins of pronotum rather contrastingly whitish, humeral lobes and a faint midline on posterior part of disk blackish. Corium with a minute pale apical dot. Dorsum of abdomen pink, connexivum reddish brown with extreme lateral margin black. Rostrum black. Pronotum medially and laterally darkened. Meso- and metathorax with minute brown puncturing. Tubercles on venter mainly pale. Legs reddish brown, with a rather distinct dark irroration, tibiae appearing rather pale.

The largest species of the genus. Hair covering short, yellowish. Anterior part of head moderately constricted at middle; antennal tubercles fairly large; tuberculation rather remote; ocular index 3.7. Proportions between antennal joints 35:28?, 1st joint 1.25 times as long as 2nd. Rostrum extending beyond fore coxae. Pronotum appearing narrow owing to the fairly weakly produced humeral lobes (Fig. 55), 1.4 times as broad as long, 0.7 times as broad as greatest breadth of abdomen; lateral margins of anterior part insinuated, coarsely tuberculate; calli slightly raised and, like the rest of the anterior part, rugose and tuberculate; posterior part of disk densely transversely rugose, minutely punctate and provided with a few pale tubercles, a transverse ridge in front of basal margin. Scutellum minutely punctate and rugose. Elytra finely punctate. Abdomen strongly expanded, roundedly ovate in outline. Connexivum indistinctly punctate. Under surface of thorax minutely tuberculate and punctate. Venter rugose, tuberculation rather indistinct. Legs appearing short and incrassate. Under surface of fore and middle femora with two rows of coarse teeth, the corresponding tibiae roughly dentate on under surface. Hind femur (Fig. 51) 5 times as long as broad, hind margin with two large subbasal teeth, apical part with 3 small teeth and minute tubercles; tibia distinctly shorter than femur (51:61), minutely dentate.

Male genitalia: Pygophore (Fig. 53) narrow, rounded apically, ventral surface finely punctate; medio-ventral process (Fig. 48) very short and broad. Stylus (Fig. 58—59) broad, apex rather weakly recurved.

Material studied: Central African Republic: Boukoko, 1 ♂, holotype, 7.X.1966, M. Boulard, author's collection. The specimen was found on *Theobroma cacao.*

Daladeropsis hutereauae Scht. (Fig. 54, 60—63, 68—69)

Length ♂ 25—28 mm, ♀ 24 mm. Colouring as in *D. africana.* Readily distinguished from *D. africana* and *D. pelops* by the smaller size, the narrower body, the shorter and nearly horizontal humeral lobes of the pronotum, the much narrower ovate abdomen and the shorter extremities.

Head tapering apicad. Proportions between antennal joints 24:23:21:19 (♂ holotype) or 19:19:20:14 (♀), 1st joint 1.4—1.5 times as long as diatone, 2nd distinctly flattened, 3rd clavate (Fig. 62—63). Humeral lobes of pronotum (Fig. 60) roundedly produced laterad, only slightly upcurved, lateral margins in front of them distinctly insinuated, coarsely dentate. Tuberculation of venter minute, remote and concolorous. Hind femora (Fig. 61) in both sexes gracile, a little longer than tibiae (50:41 in ♂, 41:38 in ♀).

Male genitalia: Pygophore (Fig. 54) ovate in outline; medio-ventral process (Fig. 68) dark, narrowly triangular, straight. Stylus robust (Fig. 69).

Material studied: Zaire: Adrangu, 1 ♂, 1912, Hutereau; Katanga, Lukafu, 1 ♂, 6—22.XII.1930, G. F. de Witte; Uele, Tukpwo, 1 ♀, IX.1937, L. Leconto, in Mus. Tervuren.

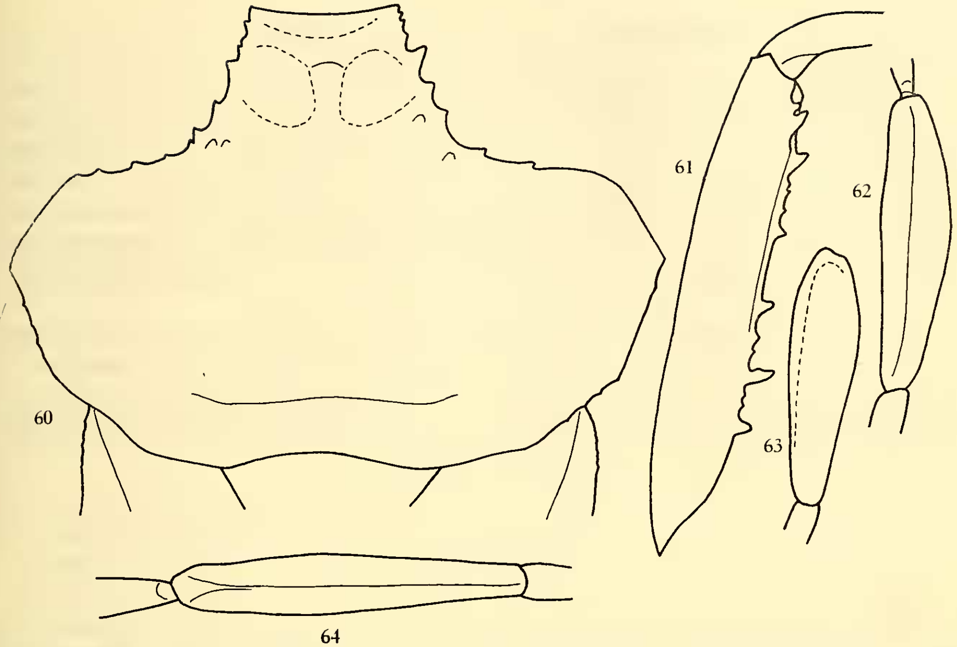


Fig. 60—63. *Daladeropsis hutereauae* Scht. (type). 60, pronotum; 61, hind femur; 62, 3rd antennal joint (♂); 63, the same (♀). Fig. 64. *D. dispar* Scht., 3rd antennal joint (♂)

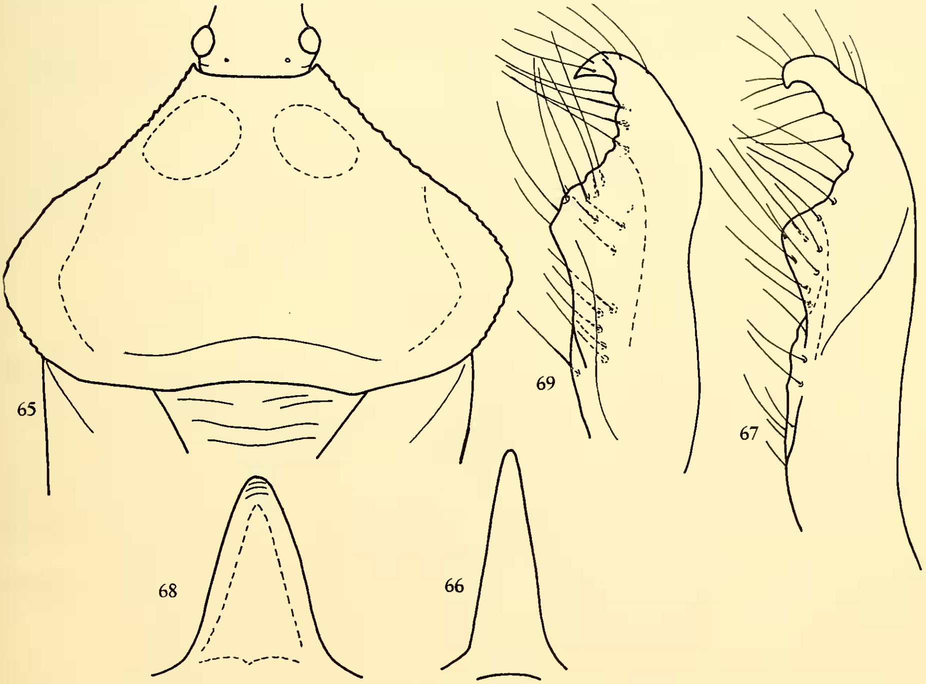


Fig. 65—67. *Daladeropsis dispar* Scht. 65, pronotum; 66, medio-ventral process of pygophore; 67, stylus. Fig. 68—69. *D. hutereauae* Scht. (type). 68, medio-ventral process of pygophore; 69, stylus

Daladeropsis dispar Scht. (Fig. 64—67)

Length ♂ 25 mm, ♀ 23 mm. Uniformly reddish brown.

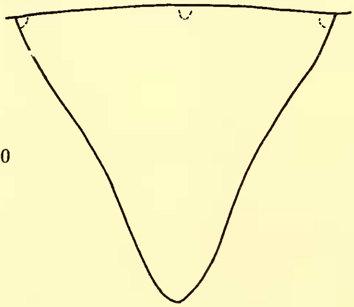
Head tapering apicad. Proportions between antennal joints 18:20:19:15 (♂) or 18:19:19:15 (♀), 1st joint 1.2—1.44 times as long as diatone, 2nd only slightly depressed, 3rd (Fig. 64) narrowly clavate. Shape of pronotum (Fig. 65) unique: humeral lobes rounded, horizontal, lateral margins straight, densely and minutely serrate; transverse ridge in front of basal margin faint. Abdomen ovate. Tuberculation of venter remote and minute. Hind femur gracile, a little longer than tibia (39:35 in ♂, 41:40 in ♀).

Male genitalia: Pygophore a little narrower than in *D. hutereauae*; medio-ventral process (Fig. 66) pale, slender, digitate, recurved caudad. Stylus (Fig. 67) gracile.

Material studied: Zaire: Lulua, Kapanga, 1 ♂ and 1 ♀, XII.1932, F. G. Overlaet, author's collection; Katanga, Kafakumba, 1 ♀, I.1925, E. le Moult, Mus. Leiden (recorded as *D. hutereauae* by Blöte, 1938, p. 283).

4. *Carbula melanacantha* (F.) *breviscutum* SUBSPEC.NOV. (HET. PENTATOMIDAE) (Fig. 70—72)

Carbula melanacantha is, like many other species of the genus, highly variable in the shape of the humeral angles of the pronotum. They are usually sharp, horn-shaped, but also specimens (originally described as a separate species, *C. cuneata* Dist.) with bluntly triangular humeral lobes exist. Both forms are connected with intermediates and the shape of the humeral angles is not of any taxonomic value.



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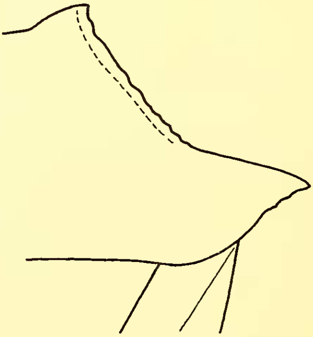

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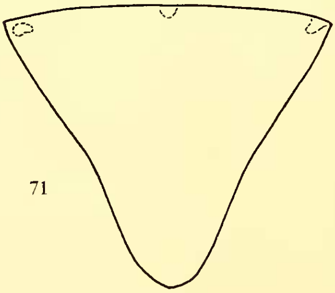

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Fig. 70. *Carbula melanacantha melanacantha* (F.), scutellum. Fig. 71—72. *C. melanacantha breviscutum* ssp. n. 71, scutellum; 72, pronotum

A population from Adiopodoumé differs from the nominate form in several respects. Since the differences seem to be constant, the population apparently represents a separate geographical race and is described below. The shape of the humeral angles (Fig. 72) seems to be rather constant in the new race. The male genitalia in both races are similar.

C. melanacantha melanacantha (F.)	*C. melanacantha breviscutum* ssp.n.
1. body more elongate.	1. body appearing short and broad.
2. head somewhat longer, about as long as broad.	2. head shorter, broader than long (54:52).
3. scutellum elongate (Fig. 70), about 1.04 times as broad as long.	3. scutellum (Fig. 71) 1.09—1.1 times as broad as long, remarkably broad apically.
4. opaque evaporatoria of meso- and metathorax slightly embrowned; venter yellowish, with 3 regular black longitudinal bands, puncturing on the pale areas concolorous.	4. opaque evaporatoria of meso- and metathorax dark brown or blackish; venter yellow-brown, with 3 irregular dark brown longitudinal bands; the pale areas with scattered brown punctures among the common concolorous puncturing.
5. range: widespread in the Guinean subregion, the Sudan.	5. range: Ivory Coast.

Material studied: Ivory Coast: Adiopodoumé, 1 ♂, holotype and 6 paratypes (♂, ♀), IV—V.1964, leg. Cobben, author's collection, paratypes also in coll. of Laboratory of Entomology, Wageningen.

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